

TI Corporate Citizenship Topic Brief



Product innovation

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Why it matters

Innovation is our lifeblood. Tlrs are constantly working to redefine what's possible and create products that change our world for the better.



Our approach

Innovation is the way we solve problems and push the boundaries of what's possible to create products that enable the technologies of tomorrow. Our commitment to innovation is embodied in our people, our products and our culture. We continually challenge the status quo to shape the future of electronics, and enhance and improve people's lives.

Whether enabling smarter vehicles, power grids and entire cities, increasing energy efficiency, making vehicles safer or improving people's health, our technologies are providing a host of environmental and social benefits.

With a broad portfolio of analog and embedded products, our recent advances include:

- A new family of highly accurate, single-chip TI millimeter-wave (mmWave) sensors, which enable applications ranging from automotive radar to industrial automation. These precision sensors give designers a platform to bring new levels of intelligence, safety and autonomy to automobiles, buildings, factories and drones.
- A new single, integrated chip – the MSP430FR6047 microcontroller (MCU) – gives utility companies the ability to measure the flow of water – as well as heat and natural gas – with precision and accuracy. The device uses soundwaves to calculate how much volume is flowing through pipes.
- The Fast Current Loop (FCL) software solution makes it easier for motor-drive designers to deliver smarter products to their industrial customers. In turn, those customers can build more advanced robots, manufacture better products and innovate more than ever.

Our expectations

We expect innovation from every business, department and Tler – from process innovations in our support organizations, to technological breakthroughs in our research and development labs, to continuous advancements in our business units.

Products

TI technology is at the heart of all things electronic. We develop analog chips and embedded processors – and there hardly isn't an electronic device on the planet that doesn't require an analog chip and most require an embedded processor.

Design strategy

When we design products, we ask our customers what problems they are trying to solve and what problems specifically they have with their products – performance, size, reliability or efficiency? Then we set out to deliver technological solutions through:

- Investing in research and development that will align with our customers' needs and help us take advantage of key sustainability opportunities
- Incubating and prioritizing breakthrough ideas
- Taking a holistic look at how a technology may benefit an entire system, optimize overall performance, reduce the total cost of ownership and enhance ease of use
- Executing competitive roadmaps within our own business units and specialized labs
- Developing world-class manufacturing and packaging technologies

Additionally, our technologists collaborate with universities, associations and industry consortia, as well as participate in industry forums, standards committees, educational committees, technical conferences and university research roadmap development reviews. These partnerships help challenge our thinking and align with our strategic objectives and expertise.

For more than 30 years, we have forged relationships with universities that span the globe through our [Worldwide University Program](#). We also sponsor significant research and [global design contests for undergraduate engineering students](#).

Research and development (R&D)

We embed R&D teams in every business unit across the company, where they work directly with customers and stay attuned to market realities. We want our customers to quickly benefit from such innovations as increased performance, lower power, enhanced features, greater interoperability and miniaturization – from manufacturing technology to packaging, testing, design, software and support tools.

Basic research

We conduct basic research activities that have intrinsic long-term value, but may not have immediate commercial benefits. Most of this investment supports university research to stay at the forefront of semiconductor technology. Projects must align with our company strategy and undergo environmental impact assessments.

On average, TI invests more than \$1 billion annually on research and development. Our investments are leading us into the next generation of innovation, into such areas as energy harvesting, computational photography, biomedical electronics, power management, analog technology and robotics.

Idea creation

Our investment in “idea creation” – the generation of new product ideas – represents about 1 percent of total R&D spending. When evaluating ideas, we consider novelty and game-changing capability, potential return on investment, early market applicability, societal benefit and cost.

Our innovation centers are designed to drive incremental improvements across our product portfolio, as well as breakthrough technologies. Dedicated resources at our research labs focus on:

- Analog and mixed-signal processing, energy management, medical and health care, cloud computing, safety, security, sensing and the internet of things
- Defining, evaluating and characterizing new products and technologies
- Product reliability and failure analysis
- Injecting best-in-class technology into current and future products such as video, imaging and vision; communication systems; lighting; motor control; speech and audio; solar; and systems architecture

Outside the company, our investments in idea creation include work in biomedical electronics, autonomous vehicles, sensing and power management.

Development

Most of our R&D spending is spread across four areas of development: designing, testing, perfecting and launching. This includes:

- Environmental innovation, such as smart grid technology, electronics to support renewable energy and energy harvesting
- Social innovation, such as science, technology, engineering and math education initiatives and programs to develop products that help improve health care

See Responsible manufacturing to learn more about our product:

- Management system
- Policies and practices
- Governance structure

Assessing our progress

Our innovation succeeds when our new products are successfully launched into targeted markets, providing competitive differentiation, customer satisfaction, growth in market share and strong financial returns to our shareholders.